

## **TOOL HOLDER**

### **BACKGROUND OF THE INVENTION**

#### **Field of the Invention**

[0001] The invention relates to a tool holder, and more particularly, a rotary  
5 tool holder for releasably holding rotary tool holders for precise cutting or grinding  
operations.

#### **Description of the Background Art**

[0002] Rotary tapered tool holders, commonly referred to as "steep taper" tool  
holders, are well known in the art. Steep taper tool holders have a male tapered  
10 portion extending from a V-flange portion. The V-flange portion has a V-shaped  
groove to assist the machine tool changer mechanism in gripping the tool. In the  
U.S., one of the most common steep taper tool holder designs is the Caterpillar V-  
flange tool holder, generally referred to as a "CV" tool holder. CV tool holders are  
one of several standards for very similar tool holder designs, all of which have 7/24  
15 tapers (7 inches of diameter change per 24 inches of length.) Another common 7/24  
tapered tool holder standard is the "BT" tool holder.

[0003] The tapered shank portion of the steep taper tool holder is held in a  
corresponding female tapered portion of a spindle. The tool holder is held in and  
rotated at high speeds by the spindle. There are generally two types of steep taper  
20 tool holders: (1) taper-only contact tool holders, in which only the tapered surface of  
the tool holder contacts the tapered inside surface of the spindle; and (2) face-taper  
contact tool holders, wherein the face of the tool holder flange is in contact with the  
face of the spindle in addition to surface contact between the tapered portion of the  
tool holder and the spindle. The face-taper contact type tool holder can require a  
25 specially designed spindle, wherein the mating face of the spindle is machined more  
precisely to facilitate operating in contact with the face of the tool holder V-flange  
portion.

[0004] Conventional steep taper tool holders of both types can suffer from  
certain problems. For example, in a standard steep taper tool holder the taper  
30 tolerances for tool holder taper and spindle taper produce a situation wherein the  
adjacent tapers are in hard contact at the front, but may be out of contact at the rear.